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A Review on Amomum subulatum and Elettaria Cardamomum with their Pharmacological Activity

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ABSTRACT

The cardamom is very common spices in India its mainly two type Amomum subulatum and Elettaria Cardamomum belongs to the family zingiberaceae Amomum subulatum is also known as "Badi Elaichi". It's traditionally uses as mouth freshener or digestive agent.it is very common spices in Indian food. Its main chemical constituent is α-terpinyl acetate, 1,8-cineole, α-terpineol, limonene, α-pinene, β-pinene main chemical is alpha terpinyl acetate in cardamom. Its have many pharmacological activity like antiseptic (pulmonary), antispasmodic (neuromuscular), aphrodisiac, expectorant, anthelminthic, antibacterial (variable), cephalic, cardiotonic, diuretic, emmenagogue, sialagogue and stomachic. It's also act as a stimulant of nervous system some research said that it is also work as a antidote in some venom. According to recent research, required a further study on large scale because some unidentified chemicals are present in their alcoholic extract.

Keywords-- Black Cardamom, Cardamom, Eleichi, Green Cardamom

INTRODUCTION

The Elaichi is very common spice in India. It's famous with the name of queen of spices [1]. The cardamom also divided into two main categories small and large cardamom, cardamom is a type of dried fruit found on perennial herbaceous plant, (Elettaria cardamomum Maton) belong to family zingiberaceae [2]. The potential health benefits of cardamom have found in many diseases and in some health problems. Health benefit of Cardamom is also found in NAFLD (nonalcoholic fatty liver disease) [3]. The cardamom also uses as windiness and stomachic carminative, aromatic stimulant to prevent unpleasant smell in mouth, in nausea and also in vomiting, to prevent pyrosis (excessive watering in mouth) [2] in study it has found cardamom has also effect on nervous system [2] major production of cardamom is occurs in North Sikkim. Cardamom has different-2 according to locality for example Alainchi in Neplai, Elaichi in Hindi, Bhadraila in Sanskrit, Bara llachi in Bengal, kattelam and perelam in Tamil Nadu [4]. The large cardamom has significance role in to boost up our immunity and health. Large cardamom is also well known as Black cardamom (BadiElaichi) [5]. It has also affected on lungs and in the treatment of tuberculosis [5]. Cardamom is a crucial drug in Unani and Ayurveda from ancient time [5].

Figure 1: *cardamom seeds.*

Table 1: *Different name of black cardamom according to the Regions [5].*

Sanskrit	Bhadr, stulaila Bhadrai
Hindi	Bari elachi/bari illayaca
Urdu	Badi Elaichi, Heel Kalan, poorbi elaichi
Kannada	Dodda Yalakki, Nepdi Elakki
English	Black cardamom
Bengali	Baara aliach
Malayalam	Valiya Elam, Perelam
	Elaicho, Mothi Elichi
Marathi	Mothi Elayachi
Oriya	Bada aleicha, Aleicha
Punjabi	Budi Eleichi
Tamil	Periya Elam, Beraelam, Kattu Elam Telugu Pedda Elakulu
French	Cardamome
German	Kardamom Italian Cardamomo, Cardamone
Spanish	Cardamomo Burmese Phalazee
Chinese Ts‟ao-k‟ou Indian	lachi, e(e)lachi, ela(i)chi, illaichi Persian Qakilahe kalan
Indonesian	Kapulaga

BOTANICAL DESCRIPTION

Cardamom is available in two colour green and black. It is a plant which height of 1.5 to 3 meter tall. Amomum subulatum is biological name of black/large cardamom. One fruit of A. subulatum consist 15-20 sporadic, dentate-undulate wings which are come out from the peak to base for 66% of its length [5].

Green cardamom (Elettaria Cardamomum) is also a name of cardamom because of its colour [6]. According to the United State Department of Agriculture, taxonomic description of cardamom is [6] Black cardamom and biological name is Amomum subulatumit is belonging to the category zingiberaceae [5]

Kingdom- Plantae – Plants
Subkingdom- Tracheobionta – Vascular plant
Super-division- Spermatophyta – Seed
Plant Division- Magnoliophyta – Flowering
Plant Class- Liliopsida – Monocotyledons
Subclass- Zingiberidae
Order- Zingiberales
Family- Zingiberaceae – Gingerfamily
Genus: -Elettaria Maton
Spices: - Elettaria cardamomum (L.) [6]

Cardamom mainly is two type small green cardamom (Elettaria Cardamomum) & large red and black cardamom. The largest annual production of cardamom (amomum subulatum), 4000 MT, followed by Nepal (2500 MT) and Bhutan (1000 MT) more than 85% within the India.

TYPE OF CARDAMOM

Cardamom is mainly two type (green) small cardamom and (black) large cardamom. Small green cardamom biological source is Elettaria Cardamomum and it is the most common type of cardamom while black cardamom is mainly grown in India. The largest producing cardamom country is Gautemala in India [5].

Chemical Constituent-Table under the study of Gas Chromatography- Mass Spectroscopy (GC-MS) area (%) [7].

Table 2:

Chemical component	Green Cardamom	Black Cardamom
α-terpinyl acetate	72.37	-
1,8-cineole	10.16	65.50
α-terpineol	0.79	3.30
limonene	0.30	3.60
α-pinene	1.58	2.78
β-pinene	0.19	3.34

1. α-terpinyl Acetate

Its chemical formula is $C_{12}H_{20}O_2$and other name of α-terpinyl acetate is Terpineol acetate. IUPAC Name of α-terpinyl acetate is-2-(4-methylcyclohex-3-en-1-yl) propan-2-yl acetate. Boiling point is 115.0℃.

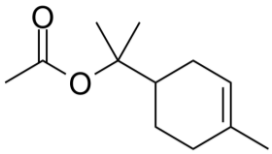

Figure 2: *α-terpinyl acetate.*

2. 1, 8-cineole

Its chemical formula is $C_{10}H_{18}O$ and molecular weight is 154.25 and other name is Eucalyptol. IUPAC name of 1,8-cineole is 1,3,3-trimethyl-2-oxabicyclo [2.2.2]octane. Its chemical structure is shows in Fig. 3.

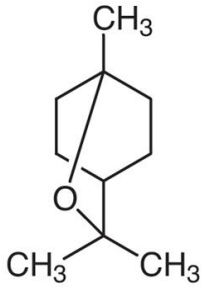

Figure 3: *1,8-cineole.*

3. α-terpineol

Its chemical formula is $C_{10}H_{18}0$. Molecular weight is 154.25 and other name is-2-(4-methylcyclohex-3-en-1-yl) propan-2-ol,p-Menth-1 -en-8-ol. IUPAC name--2-(4-methylcyclohex-3-en-1-yl) propan-2-ol. Chemical structure is shows in Fig. 4.

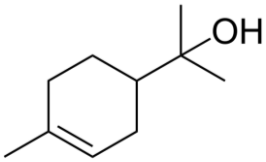

Figure 4: *α-terpineol.*

4. Limonene

Its chemical formula is $C_{10}H_{16}$ and molecular weight is 136.23 and other name is cinene, cajaputene etc. IUPAC name is 1-methyl-4-prop-1-en-2-ylcyclohexene with boiling point 176.0^{0}C. It is colour less liquid with pleasant lemon like odour and sweet and citrus in taste. Chemical structure is shows in Fig 5.

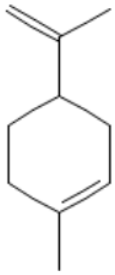

Figure 5: *Limonene.*

5. α-pinene

Its chemical formula isC10H16 and molecular weight is 136.23 and other name is Acintene A, alpha. -Pinene etc. Boiling point is 313.2^{0}F or 155^{0}C. Its IUPAC name is 2,6,6-trimethylbicyclo [3.1.1] hept-2-ene. And chemical structure is shows in Fig 6.

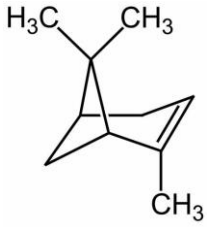

Figure 6: *α-pinene.*

6. β-pinene

Its chemical formula isC10H16 and molecular weight is 136.23 and other name is No pinene, 2(10)-Pinene, etc. it is colourless transparent liquid characteristic turpentine odour, dry woody or resinous aroma odour and piney and turpentine like taste and its boiling point is 166.0^{0}C. Chemical structure is shows in Fig 7.

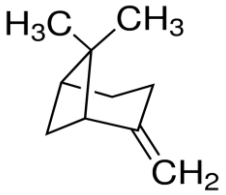

Figure 7: *β-pinene.*

PHARMACOLOGICAL ACTIVITY OF CARDAMOM

Cardamom has the many medicinal and pharmacological activity like- antiseptic (pulmonary), antispasmodic (neuromuscular), aphrodisiac, expectorant, anthelminthic,

antibacterial (variable), cephalic, cardiotonic, diuretic, emmenagogue, sialagogue and stomachic.

Anti-inflammatory

The small cardamom is used to treat gums infection and throat infection and also relive in inflammation of the lungs and pulmonary tuberculosis and also helpful digestive disorder. The extract of cardamom in ethanolic aqueous medium produce anti-inflammatory effect against carrageenan induced paw oedema in rat [8].

As Antidote

Some research reported that it is also effective against snake and scorpion venom [5].

Anti- ulcerogenic

The large cardamom has also use treat gastrointestinal disorder. Because it produces cooling effect [2] the methanolic extract seed of cardamom produce the analgesic effect.

Analgesic, Laxative and Anti-Depressant

The Methanolic extract at dose 140 to 280 mg/kg and ethyl extract at dose of 180 and 390 mg/kg of seeds showed analgesic effect [8].

According to researcher, the methanolic extract of cardamom seed shows a analgesic activity. Depression is very common in current days mostly every people suffering from depression it is a type of mental disorder its affect or low energy low of interest and appetite it's also impact on our life activities. Cardamom oil is also helpful in the digestive system it also act as a laxative and soothes colic. In present days marble burying test in rats to evaluate antidepressant activity of cardamom oil is studying [9].

Anti-Diarrhoeal and Anti Carminative Properties

We well know cardamom is a sweet spice and used as a flavouring agent. The fruit of cardamom has the carminative properties in GIT problems by help of extract in hot water. It's also affected in caster oil and magnesium sulphate induced diarrhoea [10].

Antioxidant

The cardamom seed are the rich source of antioxidant agent its neutralizing the free radicle oxidative stress is the main reason of many degenerative disease such as diabetes cancer cardamom is natural source of the antioxidant agent in current days natural agent are very popular in use. Some in vitro studies found that carcinogenic activity [11].

Antimicrobial Activity

Cardamom is the most investigational compound which gives antimicrobial effect gernally it carry extract of essential oil and extract of fruit and seeds. According to this study, the cardamom showed capable to cure many microorganisms which are pathogenic such as E.coli, S.aureus and bacillus cereus. And other study was carried out cardamom showed antibacterial activity against many bacteria species such as Aggregatibacter actinomycetemcomitans, Fusobacterium nucleatum, Porphyromonas gingivalis, in most of the studies was conducted and it show cardamom extract can be cure as a source of agent which are capable to treat dental problem like tooth ache and bad smell in mouth [12].

CONCLUSION

In summary, we can say that the black cardamom had very pharmacological activity such as antiseptic (pulmonary), antispasmodic (neuromuscular), aphrodisiac, expectorant, anthelminthic, antibacterial (variable), cephalic, cardiotonic, diuretic, emmenagogue, sialagogue and stomachic. In Ayurveda or Unani system of medicine cardamom is also mentioned as a queen of spice and has many pharmacological activities we already discussed. Many formulations are available according to Unani system Anushdaroo-E-Sada, Arq Elaichi, Arq Gazar Ambary, Dawa Ul Misk, Dawa-E-Mazmaza, Jawarish Anarain. It also produces cooling effect in GIT and used to remove smell in mouth.it consist many active pharmaceutical constituent such as Its main chemical constituent is α-terpinyl acetate, 1,8-cineole, α-terpineol, limonene, α-pinene, β-pinene main chemical is alpha terpinyl acetate in cardamom. It's also act as a stimulant of nervous system some research said that it is also work as antidote in some

venom. According to recent research, required a further study on large scale because some unidentified chemicals are present in their alcoholic extract.

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CONFLICT OF INTEREST

All authors declared no conflict of interest.

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